



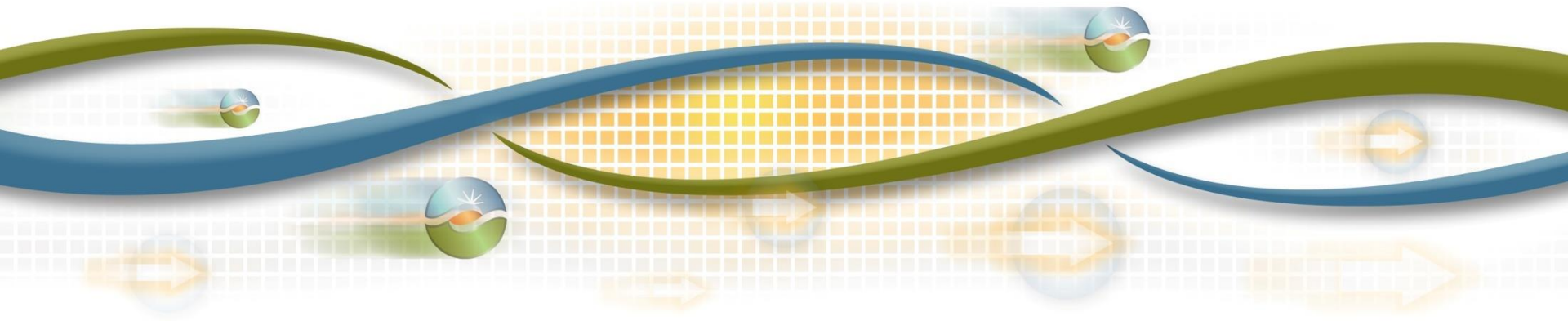
# Update to the Local Capacity Technical Study Criteria

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Stakeholder Web Conference

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# CAISO Policy Initiative Stakeholder Process

## POLICY AND PLAN DEVELOPMENT

Issue  
Paper

Straw  
Proposal

Draft Final  
Proposal

Nov 2019  
ISO Board



Stakeholder Input

**We are here**

# Agenda

- Introduction
- Purpose of stakeholder initiative
- Proposed update of contingency category definitions
- Proposed update for Bulk Electric System (BES) voltage level definition
- Review alignment with mandatory standards
  - Differences between mandatory standards and the LCT criteria
  - Fully align LCT criteria with mandatory criteria
  - Partially align LCT criteria with mandatory criteria
- Open Discussion
- Next Steps

# Introduction

- Resource Adequacy (RA)
  - Ensure that capacity exists and is under contract in order for all load to be served by responsible Load Serving Entities (LSEs)
  - Generally, LSEs will demonstrate that they have secured adequate qualified capacity to serve their peak load including planning reserve (every month in the month ahead timeframe).
  - Generally, LSEs will demonstrate, in the year ahead timeframe that they have secured minimum 90% of the next summer's peak load needs including planning reserve.
  - All resources participating in the ISO markets under an RA contract will have an RA must-offer-obligation to the ISO.

# Introduction (Cont.)

- ISO Tariff
  - ISO can determine minimum local resource requirements on LSEs in order to maintain reliability standards
  - If LSE procurement falls short of ISO's identified needs then ISO may engage in backstop procurement role to assure reliability standards are met in local areas

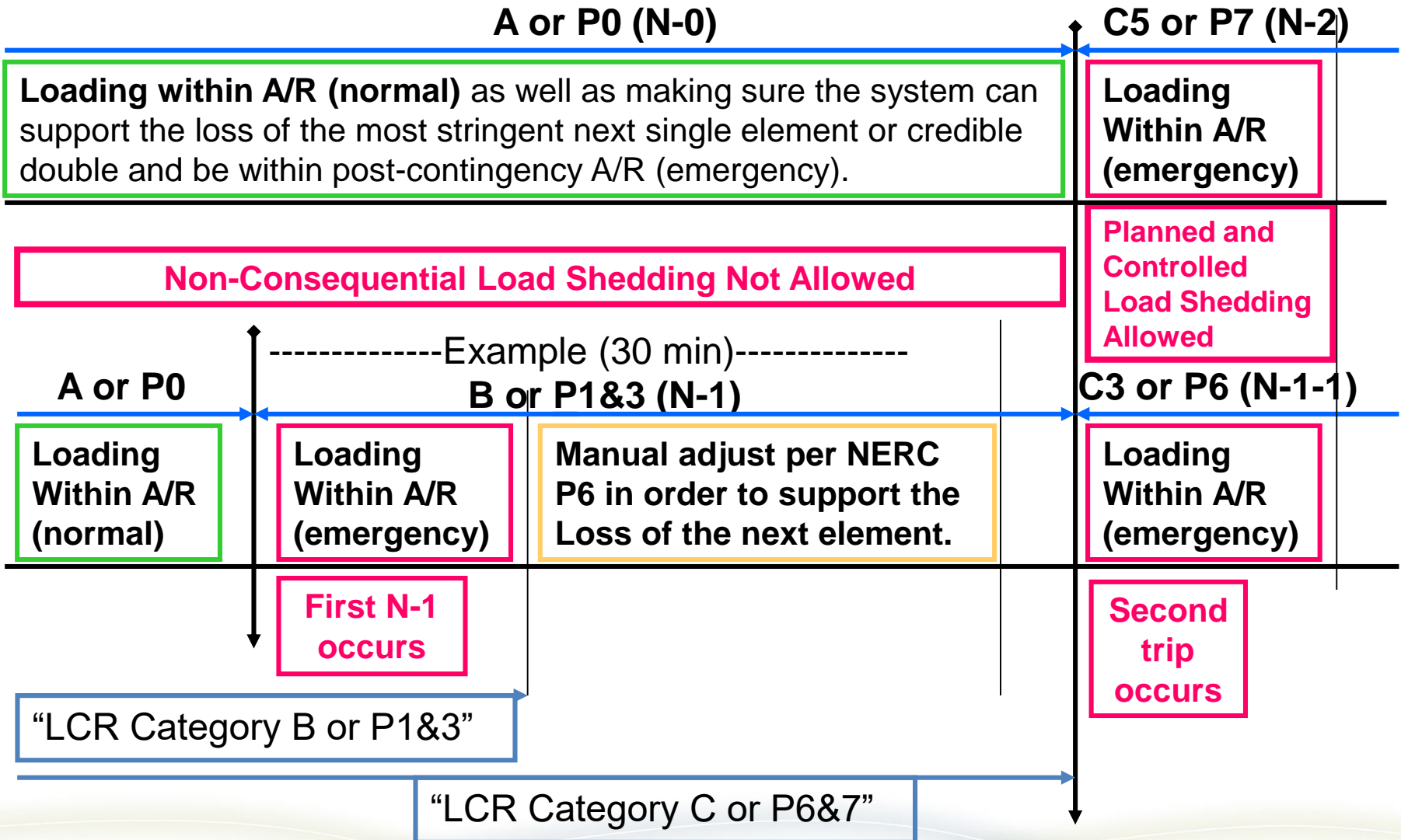
# Purpose of stakeholder initiative

- Update the Local Capacity Technical (LCT) study
  - Criteria as dictated by ISO Tariff section 40.3.1.1 and
  - Contingencies as identified in ISO Tariff section 40.3.1.2.
- Initially developed through the LCT Study Advisory Group (“LSAG”); an advisory group formed by the CAISO to assist the CAISO in its preparation for performing LCT Studies prior to the start of the Resource Adequacy program.
- LCT study criteria was established before North America Electric Reliability Corporation (NERC) required mandatory standards were formed and it represented a subset of the NERC voluntary standards available at the time.
- Currently the LCT criteria is not aligned with mandatory standards.

# Update category definitions

- Currently, the NERC TPL-001-4 standard characterizes contingencies from P0 to P7 plus Extreme contingencies
- Old standards categorized them from A to D.
- ISO proposes to replace old reference with new reference and characterization to avoid confusion and more easily correlate the LCT study criteria to the current applicable standards.

# Minimum Local Capacity Requirements





# Contingency Category & Terms

- A or P0 (N-0) normal system conditions; use normal ratings
- B or P1 (N-1) single or P3 (G-1) generator out followed by another P1 (N-1) contingency conditions; use emergency ratings
- C3 or P6 (N-1-1) double contingency conditions specifically a single – non-generator (B or P1) followed by manual readjustment and then another single contingency (B or P1); use emergency ratings
- C5 or P7 (N-2) common mode (same tower or right-of-way); use emergency ratings
- Manual Adjustment – any adjustment done by operators (other than load drop) in order to assure that the system is in a safe operating zone and can support the loss of the next most stringent single contingency
- Planned load drop means that the most limiting equipment has a higher short-term emergency rating (i.e., 30 min) AND the operators have a operating procedure that clearly describes the actions needed to be taken in order to shed load
- Controlled load drop means the use of a Special Protection Scheme

# Update Bulk Electric System (BES) voltage level definition

- NERC BES definition has changed.
- Current mandatory standards apply to BES only and includes:
  - Extra High Voltage ( > 300 kV) and
  - High Voltage (generally > 100 kV and < 300 kV).
- Generally elements < 100 kV are not considered BES and they are planned solely under the jurisdiction of the ISO Planning standards, for categories P0, P1 and P3, the rest of categories may be evaluated for risk and consequences and may be used for project justification in conjunction with reduction in load outage exposure, through a benefit to cost ratio (BCR).
- ISO proposes to only use the same criteria as ISO Planning Standards for non-BES elements.

## Review alignment with mandatory standards

- Currently the LCT criteria drives the Local RA requirement and procurement, including approval of new local resources as an integral part of the future resource fleet.
- Currently the mandatory standards drive new transmission development as well as the need to maintain certain old resources under Reliability Must Run contracts until all mandatory standards are met without them.
- Should the LCT study criteria be changed in order to be more aligned with mandatory standards?

# Difference between mandatory standards vs. LCT criteria

Contingency Component(s)	Mandatory Reliability Standards	Existing Local Capacity Criteria	Proposed Local Capacity Criteria
<b><u>P0 – No Contingencies</u></b>	X	X	X
<b><u>P1 – Single Contingency</u></b>			
1. Generator (G-1)	X	X <sup>1</sup>	X <sup>1</sup>
2. Transmission Circuit (L-1)	X	X <sup>1</sup>	X <sup>1</sup>
3. Transformer (T-1)	X	X <sup>1,2</sup>	X <sup>1,2</sup>
4. Shunt Device	X		?
5. Single Pole (dc) Line	X	X <sup>1</sup>	X <sup>1</sup>
<b><u>P2 – Single contingency</u></b>			
1. Opening a line section w/o a fault	X		?
2. Bus Section fault	X		?
3. Internal Breaker fault (non-Bus-tie Breaker)	X		?
4. Internal Breaker fault (Bus-tie Breaker)	X		?
<b><u>P3 – Multiple Contingency – G-1 + system adjustment and:</u></b>			
1. Generator (G-1)	X	X	X
2. Transmission Circuit (L-1)	X	X	X
3. Transformer (T-1)	X	X <sup>2</sup>	X <sup>2</sup>
4. Shunt Device	X		?
5. Single Pole (dc) Line	X	X	X

# Difference between mandatory standards vs. LCT criteria

Contingency Component(s)	Mandatory Reliability Standards	Existing Local Capacity Criteria	Proposed Local Capacity Criteria
<b><u>P4 – Multiple Contingency - Fault plus stuck breaker</u></b>			
1. Generator (G-1)	X		?
2. Transmission Circuit (L-1)	X		?
3. Transformer (T-1)	X		?
4. Shunt Device	X		?
5. Bus section	X		?
6. Bus-tie breaker	X		?
<b><u>P5 – Multiple Contingency – Relay failure (delayed clearing)</u></b>			
1. Generator (G-1)	X		?
2. Transmission Circuit (L-1)	X		?
3. Transformer (T-1)	X		?
4. Shunt Device	X		?
5. Bus section	X		?
<b><u>P6 – Multiple Contingency – P1.2-P1.5 system adjustment and:</u></b>			
1. Transmission Circuit (L-1)	X	x	?
2. Transformer (T-1)	X	x	?
3. Shunt Device	X		?
4. Bus section	X		?

# Difference between mandatory standards vs. LCT criteria

Contingency Component(s)	Mandatory Reliability Standards	Existing Local Capacity Criteria	Proposed Local Capacity Criteria
<b><u>P7 – Multiple Contingency - Fault plus stuck breaker</u></b>			
1. Two circuits on common structure (L-2)	X	X	X
2. Bipolar DC line	X	X	X
<b><u>Extreme event – loss of two or more elements</u></b>			
Two generators (Common Mode) G-2	X <sup>4</sup>	X	X
Any P1.1-P1.3 & P1.5 system readjusted (Common Mode) L-2	X <sup>4</sup>	X <sup>3</sup>	X <sup>3</sup>
All other extreme combinations.	X <sup>4</sup>		?
<p><sup>1</sup> System must be able to readjust to a safe operating zone in order to be able to support the loss of the next contingency.</p> <p><sup>2</sup> A thermal or voltage criterion violation resulting from a transformer outage may not be cause for a local area reliability requirement if the violation is considered marginal (e.g. acceptable loss of facility life or low voltage), otherwise, such a violation will necessitate creation of a requirement.</p> <p><sup>3</sup> Evaluate for risks and consequence, per NERC standards. No voltage collapse or dynamic instability allowed.</p> <p><sup>4</sup> Evaluate for risks and consequence, per NERC standards.</p>			

# Option 1 - Fully align LCT criteria with mandatory criteria

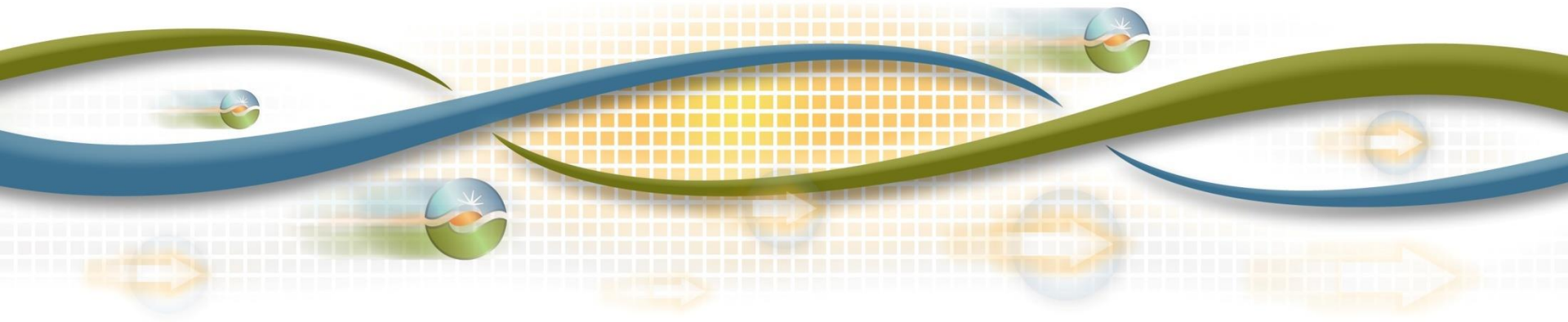
- Provides level playing field for build-up of transmission and/or new RA resources.
- Provides level playing field for build-up of new RA resources vs. old in need of retirement resources.
- Provides decision makers better tools to prepare for long-term overall system planning.
- The Reliability Must Run (RMR) need for an old resources asking for retirement/mothball is evaluated against entire mandatory criteria.
- Load shedding is a viable mitigation, where allowed by NERC standards. New or upgrades Special Protection Schemes/Remedial Action Schemes (SPS/RAS) can be used and must comply with ISO Grid Planning standards.

## Option 2 – Retain partial alignment of LCT study criteria with mandatory criteria

- Potentially provides a slightly lower cost of “RA Insurance” against certain local contingencies.
- Does not provide level playing field for build-up of transmission and/or new RA resources.
- Does not provide level playing field for build-up of new RA resources vs. old in need of retirement resources.
- The Reliability Must Run (RMR) need for an old resources asking for retirement/mothball is evaluated against entire mandatory criteria.
- Load shedding is a viable mitigation, where allowed by NERC standards. New or upgrades Special Protection Schemes/Remedial Action Schemes (SPS/RAS) can be used and must comply with ISO Grid Planning standards.



## Open discussion



# Initiative Schedule

## Local Capacity Technical Study Criteria Update

- Issue Paper – May 23
- ISO Stakeholder call May 30, 2019 – comments by June 13<sup>th</sup>
- Straw Proposal – July 11
- ISO Stakeholder meeting July 18, 2019 – comments by Aug. 1<sup>th</sup>
- Revised Straw – Only if necessary (will differ dates below)
- Draft Final Proposal – August 22, 2019
- ISO Stakeholder call Aug. 29, 2019 – comments by Sept. 12<sup>th</sup>
- Board of Governors Meeting November 13-14, 2019
- FERC filing after Board approval

# Next Steps

- Stakeholder comments to be submitted by June 13
  - Stakeholders requested to submit comments to:  
[regionaltransmission@caiso.com](mailto:regionaltransmission@caiso.com)
  - Stakeholder comments are to be submitted within two weeks after stakeholder meetings
  - ISO will post comments and responses on website

Thank you for your participation.