



# **Updates to the Local Capacity Technical Criteria**

## **Draft Final Proposal**

**September 3, 2019**

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# Updates to the Local Capacity Criteria Draft Final Proposal

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## 1. Purpose

The purpose of this initiative is to 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.

The LCT study results based on the study criteria are provided to the CPUC for consideration in its annual resource adequacy requirements program. These results are also be used by the CAISO as “Local Capacity Requirements” or “LCR” (minimum quantity of local capacity necessary to meet the LCT criteria) and for assisting in the allocation of costs of any CAISO procurement of local capacity needed to achieve the same criteria after considering the resource adequacy procurement of all Load Serving Entities (LSEs) as well as any ISO procurement of Reliability Must Run (RMR) resources (required for compliance with all mandatory standards).<sup>1</sup>

The existing Local Capacity Technical (LCT) study criteria include much of the current mandatory standards, but do not include all requirements of the mandatory planning standards. While these mandatory planning standards require the ISO to plan for a range of contingencies, the ISO can include in transmission planning studies consideration of all available resources in an area regardless of whether they are under Resource Adequacy obligations. However, currently the LCT study criteria do not address certain less probable contingencies, in effect relaxing the need for the local area resources to be under a Resource Adequacy contract – in effect, providing a lesser degree of certainty that those resources would be immediately available in the event of one of those less probable contingencies. At the same time, the Local Capacity Technical (LCT) study criteria currently require resources to be available and under contract for certain specific more extreme events, that the mandatory planning standards provide discretion to the local transmission planner in deciding whether mitigations are necessary after due consideration of the potential consequences.

Service reliability builds from grid reliability because grid reliability is reflected in the Reliability Standards of the North American Electric Reliability Council (NERC) and the Western Electricity Coordinating Council (“WECC”) Regional Criteria (collectively “Reliability Standards”). Consistent with the mandatory nature of the Reliability Standards, the CAISO is under a statutory obligation to ensure efficient use and reliable operation of the transmission grid consistent with achievement of the Reliability Standards.<sup>2</sup> The CAISO is further under an obligation, pursuant to its FERC-approved Transmission Control Agreement, to secure compliance with all “Applicable Reliability Criteria.” Applicable Reliability Criteria consists of the Reliability Standards as well as reliability criteria adopted by the CAISO (Grid Planning Standards).

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<sup>1</sup> For information regarding the conditions under which the CAISO may engage in procurement of local capacity and the allocation of the costs of such procurement, please see Sections 41 and 43 of the current CAISO Tariff, at: <http://www.caiso.com/238a/238acd24167f0.html>.

<sup>2</sup> Pub. Utilities Code § 345

## 1.1. Background & References

The Local Capacity Technical study criteria was initially discussed and recommended 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. They were subsequently included in the ISO’s tariff, and approved by FERC.

The LCT study criteria was established and included in the ISO Tariff before North America Electric Reliability Corporation (NERC) mandatory standards were formed and it represented a subset of the NERC voluntary standards available at the time.

Since the 2005-06 timeframe, NERC standards have become mandatory. Furthermore they have changed form and substance. During these years the Western Electricity Coordinating Council (WECC) regional standards and the California Independent System Operator’s (ISO) own planning standards have also changed and evolved. The most significant change to the form of the mandatory standards was the replacement of the previous category A, B, C and D contingencies with planning events P0 through P7 and extreme events.

The ISO is proposing to update the LCT study criteria in order to align it with changes already implemented in the NERC, WECC and ISO standards over time.

Reference of current standards:

- NERC TPL-001-4: <https://www.nerc.com/ layouts/15/PrintStandard.aspx?standardnumber=TPL-001-4&title=Transmission%20System%20Planning%20Performance%20Requirements&jurisdiction=null>
- WECC TPL-001-WECC-CRT-3.1: <https://www.wecc.org/Reliability/TPL-001-WECC-CRT-3.1.pdf>
- ISO Planning Standards: <http://www.aiso.com/Documents/ISOPlanningStandards-September62018.pdf>

This also creates the opportunity to re-examine several issues or concerns that have been raised by the ISO or stakeholders in the past.

## 2. Issue Paper: Updates to the Local Capacity Technical Criteria

The existing Local Capacity Technical study criteria and the differences between the mandatory planning standards and the existing local capacity criteria are set out in Table 1. The mandatory standards describe performance levels for each category of contingency by voltage level. The most important performance level from a local capacity study perspective is if “Non-Consequential Load Loss” is allowable, referring to load that is not directly connected to the element being taken out of service by the contingency or completely isolated due to the contingency.

**Table 1: Difference between the mandatory standards vs. local capacity 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</sup>
4. Shunt Device	X		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		X
2. Bus Section fault	X		X
3. Internal Breaker fault (non-Bus-tie Breaker)	X		X
4. Internal Breaker fault (Bus-tie Breaker)	X		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
4. Shunt Device	X		X
5. Single Pole (dc) Line	X	X	X
<b><u>P4 – Multiple Contingency - Fault plus stuck breaker</u></b>			
1. Generator (G-1)	X		X
2. Transmission Circuit (L-1)	X		X
3. Transformer (T-1)	X		X
4. Shunt Device	X		X
5. Bus section	X		X
6. Bus-tie breaker	X		X

<b><u>P5 – Multiple Contingency – Relay failure (delayed clearing)</u></b>			
1. Generator (G-1)	X		X
2. Transmission Circuit (L-1)	X		X
3. Transformer (T-1)	X		X
4. Shunt Device	X		X
5. Bus section	X		X
<b><u>P6 – Multiple Contingency – P1.2-P1.5 system adjustment and:</u></b>			
1. Transmission Circuit (L-1)	X	x	X
2. Transformer (T-1)	X	x	X
3. Shunt Device	X		X
4. Bus section	X		X
<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 <sup>4</sup>
Any P1.1-P1.3 & P1.5 system readjusted (Common Mode) L-2	X <sup>4</sup>	X <sup>3</sup>	X <sup>5</sup>
All other extreme combinations.	X <sup>4</sup>		X <sup>4</sup>
<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. <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. <sup>3</sup> Evaluate for risks and consequence, per NERC standards. No voltage collapse or dynamic instability allowed. <sup>4</sup> Evaluate for risks and consequence, per NERC standards. <sup>5</sup> For voltage collapse or dynamic instability situations mitigation is required “if there is a risk of cascading” beyond a relatively small predetermined area directly affected by the outage.			

Note that under the mandatory criteria:

- For Extra High Voltage (EHV > 300 kV) the mandatory criteria does not allow non-consequential load loss for categories P0, P1, P2.1-P2.3, P3, P4, P5 and allows non-consequential load loss for categories P2.4, P6, P7.
- For High Voltage (generally 100 kV < HV < 300kV) the mandatory criteria does not allow non-consequential load loss for categories P0, P1, P2.1, P3 and allows non-consequential load loss for categories P2.2-P2.4, P4, P5, P6 and P7.
- Generally elements below 100 kV are not considered Bulk Electric System (BES) and are planned only 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).

The ISO is proposing for discussion the possible changes to the existing LCT study criteria set out below.



## 2.1. Update category definitions to align with current standards

Currently, the NERC TPL-001-4 standard characterizes contingencies from P0 to P7 plus Extreme contingencies whereas the old standards categorized them from A to D.

The ISO would like to replace the old reference and characterization to the new reference and characterization to avoid confusion and more easily correlate the LCT study criteria to the current applicable standards.

### **Stakeholder Input**

General agreement regarding alignment of category definitions with current mandatory standards.

## 2.2. Update Bulk Electric System (BES) Voltage level.

Currently NERC has a new and different definition of BES than the one that was available when the LCT study criteria was established. This new NERC definition of BES generally results in more elements that are not defined as BES (generally <100 kV), and to which NERC does not require application of the mandatory standards. Non-BES elements in the ISO control area are now planned only to meet ISO standards and these standards are less demanding than the NERC mandatory standards for BES, and also lower than the existing LCT study criteria.

ISO would like to align the LCT study criteria with current planning practice for the appropriate levels by adjusting performance requirements to align with the ISO planning standards, rather than the NERC mandatory planning standards, for non-BES elements.

### **Stakeholder Input**

General agreement regarding adjusting performance requirements for non-BES elements to align with the ISO planning standards, rather than the old NERC mandatory planning standards.

## 2.3. Alignment with the LCT criteria with NERC, WECC and ISO Mandatory Standards

The ISO is considering additional changes to more fully align the LCT criteria with NERC, WECC and ISO Mandatory Standards, with two options set out below. The first option would consist of complete alignment, consisting of aligning both the categories or types contingencies to be studied, and the associated performance requirements. The second option is to fully align performance requirements for the contingencies that are studied, but to study a more limited number of categories or types of contingencies focusing on those that are more common.

### *Fully align the LCT criteria with NERC, WECC and ISO mandatory standards*

Having Resources Adequacy local resources being procured on the basis of the same criteria upon which the transmission system is planned will provide a more seamless transition from local capacity technical

study requirements into long term planning requirements, and provide a level playing field between consideration of transmission and resources in order to meet the mandatory standards. If mandatory planning standards call for reinforcement, but LCT study criteria do not, it could be more challenging for regulators to direct resource procurement in lieu of the ISO advancing conventional transmission alternatives.

This approach could potentially provide decision makers with better tools to prepare for long-term system planning.

For each local area there is less resource margin today than ten years ago, and future plans have declining resource margins in planning for many local contingencies; therefore it is more imperative now than ever that the two criteria be aligned. However, in considering if load shedding is a viable mitigation, where allowed by NERC standards, additional analysis and information would be required in the LCT study that is not required today.

#### *Maintain certain differences between the NERC, WECC and ISO mandatory standards and the LCT criteria*

This proposal will maintain the LCT criteria as being a smaller subset of the contingencies studied under mandatory standards and will continue to treat RA resources as an “appropriate level of insurance” in covering most but not all of the contingencies required to be studied by mandatory standards. The “appropriate level” would be further discussed in this process in future iterations of straw proposals.

Not fully aligning the LCT criteria with the mandatory standards will continue to have drawbacks, first that transmission can be justified on the full criteria, whereas RA resources are not; in certain circumstances this may result in advantageous treatment of transmission versus generation if generation is more challenging to procure. Second, the ISO still needs to meet the mandatory standards and therefore may need to rely more and more on its Reliability Must Run (RMR) contract to maintain in-service old and potentially inefficient resources that want to retire and are not needed for RA (system, flex or local – due to difference in criteria) however they will be needed to comply with mandatory standards that are beyond the LCT criteria, until new transmission is in place.

#### **Stakeholder Input**

ISO has received comments from Calpine, SCE, PG&E, WPTF, MRP and BAMx. An overwhelming majority of comments support full alignment of the LCR criteria with the mandatory NERC, WECC and ISO standards.

#### **Stakeholder Comments related to other issues**

ISO has received comments from SCE, PG&E, WPTF and BAMx related to technical clarifications and/or issues related to the assumptions and methodology of the either the LCR or TPP studies. ISO has either address the question directly and/or has guided the stakeholder to the appropriate ISO process that addresses their concern.

### 3. Straw Proposal: Updates to the Local Capacity Technical Criteria

Based on stakeholder feedback received during the call and in written form the CAISO moves forward with proposed changes as described herein.

#### 3.1. Update category definitions to align with current standards

Replace the old reference and characterization (A-C) to the new reference and characterization (P0-P7 plus extreme contingencies) to avoid confusion and more easily correlate the LCT study criteria to the current applicable standards.

##### **Stakeholder Input**

General agreement regarding alignment of category definitions with current mandatory standards.

#### 3.2. Update Bulk Electric System (BES) Voltage level.

Align the LCT study criteria with current planning practice for the appropriate voltage levels by adjusting performance requirements for non-BES elements to align with the ISO planning standards, rather than the old NERC planning standards<sup>3</sup>.

##### **Stakeholder Input**

General agreement regarding adjusting performance requirements for non-BES elements to align with the ISO planning standards, rather than the old NERC mandatory planning standards.

#### 3.3. Alignment with the LCT criteria with NERC, WECC and ISO Mandatory Standards

Fully align the LCT criteria for BES facilities with NERC, WECC and ISO Mandatory Standards, consisting of aligning both the categories of contingencies to be studied, and the associated performance requirements.

##### *Exception*

The current LCT criteria requires mitigating all N-1 followed by L-2 contingencies that could cause voltage collapse or dynamic instability, whereas mandatory standards only require that this “extreme event” be studied and considered, based on the planners’ assessment of risk and consequences.

ISO proposes to modify the existing LCR criteria requirement for the N-1 followed by L-2 contingencies to only require mitigation “if there is a risk of cascading” beyond a relatively small predetermined area directly affected by the outage.

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<sup>3</sup> The current mandatory NERC standards do not address non-BES elements.

**Stakeholder Input**

ISO has received comments from PG&E, MRP and BAMx. Majority of comments support full alignment of the LCR criteria with the mandatory NERC, WECC and ISO standards.

**Stakeholder Comments related to other issues**

ISO has received comments from PG&E and BAMx related to technical clarifications and/or issues related to the assumptions and methodology of the either the LCR or TPP studies. ISO has either address the question directly and/or has guided the stakeholder to the appropriate ISO process that addresses their concern.

## 4. Draft Final Proposal: Updates to the Local Capacity Technical Criteria

Based on stakeholder feedback received during the conference call and stakeholder meeting as well as in written form the CAISO moves forward with proposed changes as described herein.

### 4.1. Update category definitions to align with current standards

Replace the old reference and characterization (A-C) to the new reference and characterization (P0-P7 plus extreme contingencies) to avoid confusion and more easily correlate the LCT study criteria to the current applicable standards.

### 4.2. Update Bulk Electric System (BES) Voltage level.

Align the LCT study criteria with current planning practice for the appropriate voltage levels by adjusting performance requirements for non-BES elements to align with the ISO planning standards, rather than the old NERC planning standards<sup>4</sup>.

### 4.3. Alignment with the LCT criteria with NERC, WECC and ISO Mandatory Standards

Fully align the LCT criteria for BES facilities with NERC, WECC and ISO Mandatory Standards, consisting of aligning both the categories of contingencies to be studied, and the associated performance requirements.

#### *Exception*

The current LCT criteria requires mitigating all N-1 followed by L-2 contingencies that could cause voltage collapse or dynamic instability, whereas mandatory standards only require that this “extreme event” be studied and considered, based on the planners’ assessment of risk and consequences.

ISO proposes to modify the existing LCR criteria requirement for the N-1 followed by L-2 contingencies to only require mitigation “if there is a risk of cascading” beyond a relatively small predetermined area directly affected by the outage.

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<sup>4</sup> The current mandatory NERC standards do not address non-BES elements.

## 5. Stakeholder Engagement and EIM Governing Body Role

Stakeholder input is critical for developing changes to the LCT study criteria. The schedule proposed below allows opportunity for stakeholder involvement and feedback.

This initiative does not require briefing to EIM Governing Body, because local RA applies only to resources and Load Serving Entities (LSEs) within the ISO Balancing Authority Area (BAA). The changes to the LCT criteria will need to be approved by the CAISO Board of Governors, also changes to the ISO Tariff need to be approved by the Federal Energy Regulatory Commission (FERC).

### 5.1. Schedule

Table 3 lists the proposed schedule for the updates to the Local Capacity Technical criteria stakeholder process.

*Table 3: Schedule for Updates to the Local Capacity Technical Criteria Stakeholder Process*

Item	Date
<b>Post Issue Paper</b>	May 23, 2019
Stakeholder Call	May 30, 2019
Stakeholder Comments Due	June 13, 2019
<b>Post Straw Proposal</b>	July 11, 2019
Stakeholder Meeting	July 18, 2019
Stakeholder Comments Due	August 1, 2019
<b>Post Draft Final Proposal</b>	September 5, 2019
Stakeholder Call	September 12, 2019
Stakeholder Comments Due	September 26, 2019
<b>CAISO Board of Governors Meeting</b>	November 13-14, 2019

The CAISO proposes to present its proposal to the CAISO Board of Governors on November 13-14, 2019. The CAISO is committed to providing ample opportunity for stakeholder input into its market design, policy development, and implementation activities. Stakeholders should submit written comments to [RegionalTransmission@caiso.com](mailto:RegionalTransmission@caiso.com).

## 5.2. Next Steps

The CAISO will discuss the Draft Final Proposal during the stakeholder call on September 12, 2019. The CAISO requests stakeholders submit written comments in response to the Updates to the Local Capacity Technical criteria draft final proposal and stakeholder call by September 26, 2019.