
 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE ATTACHMENT A</b>	<b>Procedure No.</b>	E-508A
		<b>Version No.</b>	7.1
		<b>Effective Date</b>	5/12/09
<b>Load Shedding Guide</b>		<b>Distribution Restriction: NONE</b>	

**Fixed Pro-Rata Shares**

<b>UDC / MSS</b>	<b>FIXED PRO-RATA SHARE</b>
<b>Anaheim</b>	<b>1.12%</b>
<b>Azusa</b>	<b>0.12%</b>
<b>Banning</b>	<b>0.09%</b>
<b>Corona</b>	<b>0.03%</b>
<b>Lassen</b>	<b>0.04%</b>
<b>NCPA (Excluding Roseville, Including SVP)</b>	<b>1.99%</b>
<b>Pacific Gas &amp; Electric</b>	<b>42.53%</b>
<b>Pasadena</b>	<b>0.63%</b>
<b>Riverside</b>	<b>1.14%</b>
<b>San Diego Gas &amp; Electric</b>	<b>8.68%</b>
<b>Southern California Edison</b>	<b>43.25%</b>
<b>Vernon</b>	<b>0.38%</b>

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*Note: When Reserve Requirements and Load Demand exceed available resources the CAISO may require Load-Shedding to maintain reliable operation of the electric grid.*

**RA Deficient Load Shedding** When a subset of UDCs/MSSs have an insufficient showing for Resource Adequacy, the under-scheduled UDC or MSS will be required to shed Load proportional to the amount of Load that they are deficient, prior to requesting all UDCs and MSSs to shed Load pro-rata.  
 During reserve deficient conditions, take the following actions whenever time and systems conditions allow:


Step	CAISO Actions	
1	<b>If...</b>	<b>Then...</b>
	The CAISO forecasts in advance of the HASP/Real-Time Market that Load curtailment is necessary,	<p><b>Identify</b> any UDC or MSS Service Area that is RA resource deficient by using the Load-Shedding Tool.</p> <p><b>Determine</b> the amount and location of Load to be curtailed and <b>allocate</b> a portion of that required Load curtailment to each UDC or MSS Operator whose Service Area has been identified as deficient through their monthly RA showing, based on the ratio of its resource deficiency to the total Balancing Authority resource deficiency, not to exceed the RA deficiency showings.</p>

**Example 1:**

A subset of UDCs or MSSs have submitted RA deficiencies in their monthly showing and balancing energy is unavailable.

**Example 2:**

Load-Shedding must be confined to a specific region due to a contingency that causes heavy flows on a line into that region.

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**Pro-Rata  
Load  
Shedding**

If the RA deficient Load-Shedding did not yield adequate Load-Shedding, then fixed Pro-Rata Load-Shedding by all UDCs and MSSs may be required (including those entities that may have just shed Load under the deficient RA Load-Shedding effort). Complete the following as a last option if Load-Shedding is still required:

Step	CAISO Actions	
1	<b>If...</b> Additional Load-Shedding is required to manage an Emergency other than those circumstances described above,	<b>Then...</b> <b>Determine</b> the amount and location of Load to be reduced and to the extent practicable, allocate a portion to each UDC/MSS based on the following ratio:
<b>Load Shedding Responsibility</b>	=	$\frac{\text{UDC or MSS demand at the time of the CAISO Balancing Authority annual peak for the previous year}}{\text{Total Balancing Authority annual peak Demand for the previous year taking into account system considerations}}$

**Example:**

When a sudden multiple contingency or an ISO Grid reserve deficiency requires Load-Shedding assistance from the entire CAISO Balancing Authority to stabilize the grid.


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## 1. RA Deficient Load-Shedding Worksheet

<b>Total MW to be Shed</b>	<b>A.</b>
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<b>UDC / MSS</b>	<b>B.</b>	<b>D.</b>	<b>F.</b>
	<b>RA Deficient Amount (zero means no RA deficiency)</b>	<b>Event Pro-Rata Share</b>	<b>Load- Shedding Requirement (MW)</b>
Anaheim			
Azusa			
Banning			
Corona			
Lassen			
NCPA (Excluding Roseville, Including SVP)			
Pacific Gas & Electric			
Pasadena			
Riverside			
San Diego Gas & Electric			
Southern California Edison			
Vernon			
	<b>C.</b>		

- In Cell A, enter the total MW to be shed.
- In Column B, enter the RA Monthly Showing deficiencies – zero indicates no RA deficiency. Negative values indicate deficiencies. Positive values should be entered as zero.
- In Cell C, sum all values in Column B.
- In Column D, divide each value in Column B by the value in Cell C, and then multiply each result by 100 (to convert to a percentage). Resultant values determine the *Event Pro-Rata Share*.
- In Column F, multiply each value in Column E by the value in Cell A, then divide by 100. Enter the maximum of either a) this resulting number or b) the absolute value in column B. Resultant values determine Load-Shedding requirement, in MW.


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## 2. Regional Pro-Rata Load Shedding Worksheet

<b>Total MW to be Shed</b>	<b>A.</b>
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UDC / MSS	B. Fixed Pro-Rata Share	C. 1. Pro-Rata Share (Column B), or 2. Zero to exclude	E. Event Pro-Rata Share	F. Load-Shedding Requirement (MW)
Anaheim	1.12%			
Azusa	0.12%			
Banning	0.09%			
Corona	0.03%			
Lassen	0.04%			
NCPA (Excluding Roseville, Including SVP)	1.99%			
Pacific Gas & Electric	42.53%			
Pasadena	0.63%			
Riverside	1.14%			
San Diego Gas & Electric	8.68%			
Southern California Edison	43.25%			
Vernon	0.38%			
		<b>D.</b>		

1. In Cell A, enter the total MW to be shed.
2. In Column C, enter Fixed Pro-Rata Share (Column B), for each applicable UDC and MSS. To exclude a UDC or MSS, from Load-Shedding requirements (i.e. the LSE is in the wrong region), enter zero
3. In Cell D, sum all values in Column C.
4. In Column E, divide each value in Column C by the value in Cell D, then multiply each result by 100 (to convert to a percentage). Resultant values determine *Event Pro-Rata Share*.
5. In Column F, multiply each value in Column E by the value in Cell A, then divide by 100. Resultant values determine Load-Shedding requirement, in MW.

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### 3. Pro-Rata Load Shedding Worksheet

*Note: Use the following worksheets when the Load-Shedding Calculator is unavailable. In the event that the Load-Shedding Calculator is unavailable, there will be no way to pull MSS and UDC schedules to determine under-scheduling for a System Reserve Deficiency.*

Use when Load-Shedding is required by *all* MSSs and UDCs in the CAISO Balancing Authority. If Load-Shedding is required only from a subset, use the *Exclusionary Load-Shedding Worksheet* to determine Load-Shedding requirements.

<b>Total MW to be Shed</b>	<b>A.</b>
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UDC / MSS	B. Fixed Pro-Rata Share	C. Load-Shedding Requirement (MW)
Anaheim	1.12%	
Azusa	0.12%	
Banning	0.09%	
Corona	0.03%	
Lassen	0.04%	
NCPA (Excluding Roseville, Including SVP)	1.99%	
Pacific Gas & Electric	42.53%	
Pasadena	0.63%	
Riverside	1.14%	
San Diego Gas & Electric	8.68%	
Southern California Edison	43.25%	
Vernon	0.38%	

1. In Cell A, enter the total MW to be shed.
2. In Column C, multiply each value in Column B by the value in Cell A, then divide by 100. Resultant values determine Load-Shedding requirement, in MW.