
 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE ATTACHMENT A</b>	<b>Procedure No.</b>	E-508A
		<b>Version No.</b>	5.0
		<b>Effective Date</b>	4/15/08
<b>Load Shedding Guide</b>		<b>Distribution Restriction: NONE</b>	

**Fixed Pro-Rate Shares**

<b>UDC / MSS</b>	<b>FIXED PRO-RATA SHARE</b>
<b>Anaheim</b>	<b>1.08%</b>
<b>Azusa</b>	<b>0.13%</b>
<b>Banning</b>	<b>0.06%</b>
<b>Corona</b>	<b>0.03%</b>
<b>Lassen</b>	<b>0.04%</b>
<b>NCPA (Excluding Roseville, Including SVP)</b>	<b>1.79%</b>
<b>Pacific Gas &amp; Electric</b>	<b>40.02%</b>
<b>Pasadena</b>	<b>0.61%</b>
<b>Riverside</b>	<b>1.20%</b>
<b>San Diego Gas &amp; Electric</b>	<b>8.76%</b>
<b>Southern California Edison</b>	<b>45.91%</b>
<b>Vernon</b>	<b>0.37%</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.*

**Under-Scheduling**

When a subset of UDCs or MSSs under-schedule Load and balancing energy is unavailable, the under-scheduled UDC or MSS will be required to shed load proportional to the amount of Load they are under-scheduled. During reserve deficient conditions, take the following actions whenever time and systems conditions allow:


Step	CAISO Actions	
1	<b>If...</b> The CAISO forecasts in advance of the Hour-Ahead Market that Load curtailment is necessary due to under-scheduling,	<b>Then...</b> <b>Identify</b> any UDC or MSS Service Area that is resource deficient.
2	<b>If...</b> Load curtailment is required to manage an Emergency associated with insufficient Hour-Ahead Schedules of resources,	<b>Then...</b> <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, based on Hour-Ahead Schedules, as being resource-deficient based on the ratio of its resource deficiency to the total Balancing Area resource deficiency.
3	<b>If...</b> The CAISO Hour-Ahead forecasts and SC Hour-Ahead schedules are not available,	<b>Then...</b> There is no method to calculate whether a UDC or MSS is fully resourced or resource deficient. A UDC or MSS can be manually included or excluded from the firm load shedding allocation based on system conditions, previous hours schedules and loads, or other circumstances deemed necessary by the CAISO Shift Supervisor.

**Example 1:**

A subset of UDCs or MSSs under-schedule load 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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**Reserve  
Deficiency**

Fixed Pro-Rata Shares determine Load-Shedding Responsibility for UDCs and MSSs when the CAISO directs UDCs and MSSs to shed firm load. UDCs or MSSs that are under-scheduled at the time of the Load Shedding requirement may be called upon first to reduce Load for the portion that they are under-scheduled, and second for any additional load reduction necessary for a System Reserve Deficiency.

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:
	$\text{Load Shedding Responsibility} = \frac{\text{UDC or MSS demand at the time of the CAISO Balancing Area annual peak for the previous year}}{\text{Total Balancing Area annual peak Demand for the previous year taking into account system considerations}}$	

**Example:**

When a sudden multiple contingency or an ISO Grid reserve deficiency requires load-shedding assistance from the entire CAISO Balancing Area to stabilize the grid.

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## 1. ALL-UTILITIES 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 Area. 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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	<b>B.</b>	<b>C.</b>
<b>UDC / MSS</b>	<b>Fixed Pro-Rata Share</b>	<b>Load-Shedding Requirement (MW)</b>
<b>Anaheim</b>	<b>1.08%</b>	
<b>Azusa</b>	<b>0.13%</b>	
<b>Banning</b>	<b>0.06%</b>	
<b>Corona</b>	<b>0.03%</b>	
<b>Lassen</b>	<b>0.04%</b>	
<b>NCPA (Excluding Roseville, Including SVP)</b>	<b>1.79%</b>	
<b>Pacific Gas &amp; Electric</b>	<b>40.02%</b>	
<b>Pasadena</b>	<b>0.61%</b>	
<b>Riverside</b>	<b>1.20%</b>	
<b>San Diego Gas &amp; Electric</b>	<b>8.76%</b>	
<b>Southern California Edison</b>	<b>45.91%</b>	
<b>Vernon</b>	<b>0.37%</b>	

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.

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## 2. EXCLUSIONARY LOAD-SHEDDING WORKSHEET

<b>Total MW to be Shed</b>	<b>A.</b>			
	<b>B.</b>	<b>C.</b>	<b>E.</b>	<b>F.</b>
<b>UDC / MSS</b>	<b>Fixed Pro-Rata Share</b>	<b>1. Pro-Rata Share (Column B), or 2. Zero to exclude</b>	<b>Event Pro-Rata Share</b>	<b>Load-Shedding Requirement (MW)</b>
Anaheim	1.08%			
Azusa	0.13%			
Banning	0.06%			
Corona	0.03%			
Lassen	0.04%			
NCPA (Excluding Roseville, Including SVP)	1.79%			
Pacific Gas & Electric	40.02%			
Pasadena	0.61%			
Riverside	1.20%			
San Diego Gas & Electric	8.76%			
Southern California Edison	45.91%			
Vernon	0.37%			
		<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, 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.