
	OPERATING PROCEDURE	Procedure No.	E-502
		Version No.	3.2
		Effective Date	12/11/07
Emergency Manual Load Shedding		Distribution Restriction: NONE	

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Purpose

Provides guidance for Emergency Manual Load Shedding throughout the CAISO Balancing Area when conditions require prompt action to:


- Ensure personnel safety
- Preserve system integrity
- Prevent cascading outages
- Avoid a voltage collapse
- Prevent equipment damage

1. Implementation

Take the following steps when Emergency Manual Load Shedding is necessary as an immediate solution for system emergencies where there might be insufficient time to initiate other procedures:


Step	CAISO Shift Supervisor Actions	
	<p><i>Note: Emergency manual Load Shedding may be necessary to deal with:</i></p> <ul style="list-style-type: none"> • Line or facility overloading • Low voltage • Low frequency • Insufficient capacity (especially sudden onset in nature) <p><i>Although referenced for detailed operating information, PTO/UDC Manual Load Shedding bulletins and/or operating procedures will be subordinate to this procedure, and reference in those bulletins to authority for either shedding or restoration of Load is superseded by this procedure. Immediate action on the part of the PTO/UDC control centers will be required to achieve the intended results.</i></p>	
1	<p>Direct staff to refer to the following additional related emergency CAISO Operating Procedures, as necessary:</p> <ul style="list-style-type: none"> • CAISO Operating Procedure E-503, Under-Frequency Load Shedding • CAISO Operating Procedure E-508, Electrical System Emergency 	
2	<p>If...</p> <p>Emergency Manual Load Shedding is required on a Balancing Area-wide basis,</p>	<p>Then...</p> <p>Issue Emergency Manual Load Shedding requests on a pro-rata basis among PTO/UDCs based on the percentages listed in CAISO Operating Procedure E-508A, Involuntary Load-Reduction Worksheets.</p>

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Step	CAISO Shift Supervisor Actions					
3	<table border="1" style="width: 100%;"> <thead> <tr> <th style="background-color: #e0ffff;">If...</th> <th style="background-color: #e0ffff;">Then...</th> </tr> </thead> <tbody> <tr> <td>Emergency Manual Load Shedding is required in <u>only</u> a portion of the Balancing Area,</td> <td>Implement Emergency Manual Load Shedding in those areas where it will achieve the intended result.</td> </tr> </tbody> </table>		If...	Then...	Emergency Manual Load Shedding is required in <u>only</u> a portion of the Balancing Area,	Implement Emergency Manual Load Shedding in those areas where it will achieve the intended result.
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Emergency Manual Load Shedding is required in <u>only</u> a portion of the Balancing Area,	Implement Emergency Manual Load Shedding in those areas where it will achieve the intended result.					
Step	UDCs and PTOs Actions					
4	Maintain manual Load Shedding procedures that are capable of shedding the connected Load.					
5	Maintain the capability to manually shed Load without unnecessary delay, upon direction from the CAISO, with a maximum response time of ten minutes.					
6	Provide the CAISO with a list of the pre-determined blocks by UDC that denotes the approximate MW value of load for both peak and minimum load periods.					

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2. Notification

Take the following notification steps once Emergency Manual Load Shedding is deemed necessary to handle system emergencies:


Step	CAISO Shift Supervisor Actions
1	Direct the implementation of the following notification procedures as necessary: <ul style="list-style-type: none"> ○ CAISO Operating Procedure E-507, Emergency Response Team ○ CAISO Operating Procedure N-703, Event Reporting and Regulatory Notification

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3. Load Restoration

The following actions to restore manually shed Load should occur when, in the judgment of the CAISO Shift Supervisor, such actions are deemed prudent and appropriate:

Step	CAISO Shift Supervisor Actions					
<i>Caution: Due to operating constraints, it may be necessary to leave Load in a particular zone off while other Loads are restored.</i>						
1	<table border="1" style="width: 100%;"> <thead> <tr> <th style="background-color: #e0ffff;">If...</th> <th style="background-color: #e0ffff;">Then...</th> </tr> </thead> <tbody> <tr> <td>The emergency situation has been mitigated and circumstances permit,</td> <td>Restore Load in the order it was shed (i.e., the first Load shed will be the first Load restored).</td> </tr> </tbody> </table>		If...	Then...	The emergency situation has been mitigated and circumstances permit,	Restore Load in the order it was shed (i.e., the first Load shed will be the first Load restored).
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The emergency situation has been mitigated and circumstances permit,	Restore Load in the order it was shed (i.e., the first Load shed will be the first Load restored).					
2	Restore all firm Load <u>prior</u> to restoration of any Interruptible Load, unless operating constraints dictate otherwise.					
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Load needs to be restored at the interties,	Coordinate with other Balancing Areas and other WECC Sub-Regions through the Reliability Coordinator.					
Step	PTO, UDC, & SUDC Actions					
4	Wait for CAISO direction (either directly or through the CAISO or through the applicable area control center) to restore load.					
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Supporting Information


- Affected Parties**
- Metered Subsystems (MSSs)
 - Participating Transmission Owners (PTOs)
 - Small Utility Distribution Companies (SUDCs)
 - Utility Distribution Companies (UDCs)
-

Responsibilities & Authority

CAISO Shift Supervisor	Initiate implementation of this and related emergency operating procedures. Facilitate coordination of PTO/UDC load shedding plans.
CAISO NERC Certified RT Operating Personnel	Hold authority, as delegated by the Executive Officers of the CAISO, to take or direct timely and appropriate real-time actions necessary to ensure reliable operation of the CAISO Controlled Grid, up to and including shedding of Firm Load to prevent or alleviate System Operating Limit or Interconnection Reliability Operating Limit violations. These actions may be performed without obtaining approval from higher-level personnel within the CAISO.
PTO/UDC	Implement and direct local area Load Shedding plans at the direction of the CAISO.

References

CAISO Operating Procedure	E-503, Under-Frequency Load Shedding
CAISO Operating Procedure	E-507, Emergency Response Team
CAISO Operating Procedure	E-508, Electrical Emergency Plan
CAISO Operating Procedure	E-508A, Involuntary Load-Reduction Worksheets
CAISO Operating Procedure	N-703, Event Reporting and Regulatory Notification
	SDG&E EOP-5120 - Emergency Manual Load Shedding
	SDG&E EOP-5130 – Under Frequency Load Drop Schedule
	SCE SOB 115 - Load Shedding and Interconnection Separation Procedure
	SCE SOB 21 Manual Load Shed Procedure A/B/C
	WECC Operations Committee Handbook
	WECC Regional Security Plan
	NERC Standard EOP-003 Load Shedding Plans

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Policy

The CAISO will utilize existing PTO/UDC Manual Load Shedding procedures to match the load demand with the available resources; allowing the frequency and voltage to recover, minimizing additional loss of Generation, and preventing a total system collapse. As necessary, the CAISO will implement procedures for Manual Load Shedding in amounts required to stabilize the electric system and expedite frequency and voltage recovery while maintaining acceptable levels of operating reserves within the CAISO Balancing Area.


Definitions

Unless the context otherwise indicates, any word or expression defined in the Master Definitions Supplement to the CAISO Tariff shall have that meaning when capitalized in this Operating Procedure.

PTO	Participating Transmission Owner
SUDC	Small Utility Distribution Company, annual peak is less than 25 MW and is not in a local reliability area.
UDC	Utility Distribution Company

Version History

Version	Change	By	Date
1.0	Drafted		12/15/97
1.0	Revised		1/14/98
1.1	Reformat and structure Periodic Check for Accuracy		4/13/00
1.2	Referenced E-508 for current years percentages		2/7/01
1.3	Re-formatted, Annual review		4/11/02
1.4	Annual review		8/1/03
1.5	Annual review		10/01/04
1.6	Reformatted.		3/22/05
1.7	Added SUDC and clarified section 3		4/28/05
2.0	Put version 1.6 back – not ready for SUDC term		5/4/05
3.0	Put SUDC back in		2/3/06
3.1	Added CAISO NERC Certified RT Operating Personnel to Responsibility section.		11/15/06
3.2	Annual Review		12/11/07

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Technical Review

Reviewed By Content Expert	Signature	Date
Ops Support		12/11/07
Regional Transmission		2/08/06
Grid Ops		12/10/07
Market Ops		2/09/06
Scheduling		2/06/06

Approval

Approved By	Signature	Date
Director of Operations Support		2/16/06
Director of Grid Operations		2/13/06

*Signed version 3.0 only, changes to the last two version were minor and did not require full approval.